

Appl. No. 10/064,606
Amdt. Dated March 28, 2005
Reply to Office action of February 2, 2005

REMARKS/ARGUMENTS

This case has been carefully reviewed in light of the Office Action dated February 2, 2005, wherein claims 1, 2, 4-9 and 11-19 are rejected. Claims 1, 2, 4-9 and 11-19 are pending in the application. Reconsideration of the rejections in light of the following remarks is respectfully requested.

Claims 1-2, 5-9, 12-14 and 19 have been rejected as unpatentable over Margiott 2002/0086200 in view of Pfeiffer 4781248. Applicant respectfully traverses the rejection.

With respect to claims 1 and 7, the references, even if combined, do not teach, suggest, or disclose the recitations of:

(i) a plurality of upper ribs in physical contact with said bottom ribs,

or

(ii) wherein said top channel and said bottom channel are disposed to allow an initial flow of a fluid therethrough in a top direction through said top channel and a bottom direction through said bottom channel, the top direction and the bottom direction comprising different directions, and disposed to allow a portion of said fluid to alternate between said top channel and said bottom channel at a flow redirection area so as to enhance the heat transfer rate between said fluid and said fuel cell components.

As stated in the prior amendment, the "ribs" of Margiott, for example the straight channels and the interdigitated channels, would not appear to be in physical contact, even during the folding, because of the need for an intervening anode layer. Applicants did not find a section of the present Office Action addressing this recitation or argument.

With respect to the directions, the present Office Action, page 6, states that Margiott does not expressly disclosed the specific bottom/ upper ribs providing channels having different directions and cites the new reference of Pfeiffer.

However, Pfeiffer appears to use two distinct fluids that never alternate with each other (column 5, lines 13-36). More specifically, Pfeiffer describes a plate embossing pattern formed at the ends to allow better distribution of the fluids in a short length before reaching the primary heat exchange zone. The angled features in the center rectangular region on the figures shown in Pfeiffer are merely surface grooves or turbulations, not flow channels. The triangular regions that have the "bead-like" structure are formed as shown in Fig. 13 using embossed plates that touch each other at discrete pad locations (shaded areas). The result, when stacked on each other, is that one fluid moves diagonally opposite to a second fluid in the next layer. Each fluid in its own layer can proceed down a set of diagonal channels, and these channels have lateral

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connections to each other between the heads for the purpose of evening out the flow and pressure. Pfeiffer uses two fluids in alternating layers that never communicate with each other.

In contrast, as recited in Applicant's claims 1 and 7, a fluid flows in two different directions in the two channels and alternates at flow redirection areas. Pfeiffer neither discloses nor suggests the same geometry, form, or function of the cooling apparatus as described in present application. It is unclear to applicant why one of ordinary skill in the art would be motivated include the two fluid type embossed heat exchanger teachings of Pfeiffer with the single fluid fuel cell embodiment of Margiott.

Either way, Applicant submits that no combination of Margiott and Pfeiffer suggests, teaches, or discloses the elements of claims 1 and 7.

With respect to claim 19, claim 19 does not recite physical contact but does recite "different directions" with somewhat more specificity in that the angle ranges from 30 degrees to 120 degrees. Even without the physical contact, Claim 19 is believed to be in condition for allowance for the reasons discussed above with respect to "different direction" aspect of claims 1 and 7.

Claims 2, 5-6, 8-9 and 11-14 depend directly or indirectly on claims 1 or 7 and therefore define allowable subject matter over the applied art. Therefore claims 2, 5-6, 8-9 and 11-14 are believed to be similarly allowable over the applied references.

Claims 4, 11 and 15-18 are rejected as unpatentable over Margiott in view of Pfeiffer, and further in view of Wu et. Al. 2002/0026999. Claims 4, 11 and 15-18 depend directly or indirectly from claims 1 and 7. Applicants respectfully submit that Claims 1 and 7 are patentably distinct from the applied references for the reasons discussed above regardless of cavity shape. Therefore claims 4, 11 and 15-18 are believed to be similarly allowable over the applied references.

Claims 4, 11 and 15-18 are rejected as unpatentable over Margiott in view of Pfeiffer, and further in view of Thonon et. al. 5806584. Claims 4, 11 and 15-18 depend directly or indirectly from claims 1 and 7. Applicants respectfully submit that Claims 1 and 7 are patentably distinct from the applied references for the reasons discussed above regardless of cavity shape. Therefore claims 4, 11 and 15-18 are believed to be similarly allowable over the applied references.

Withdrawal of the rejections is respectfully requested, and allowance of the claims is respectfully solicited.

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Summary

Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Should the Examiner believe that anything further is needed to place the application in even better condition for allowance, the Examiner is requested to contact applicant's undersigned representative at the telephone number below.

Respectfully submitted,

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